Fuqua (W. M.)

A CASE
OF
Subperiosteal Resection of the Tibia.

BY

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George H. Taylor, a youth of sixteen years, was brought to my office by his uncle in the latter part of July last, on account of three large ulcers situated on the diaphysis of left tibia. The upper ulcer was situated one inch below the tuberosity, covered with flabby and exuberant granulations, and on exploration denuded and rough bone, with soft parts undermined, was revealed. With a little manipulation the probe passed through a fistulous tract, and into the medullary canal. The direction of this fistula was from above inwards and downwards. The lower or inferior fistula was situated on the spine of the tibia one and a half inch above the tibio-astragaloid articulation; it too communicated with the interior of the bone, and its direction was inward and upward; denuded and dead bone, with a greater undermining of the soft parts, was also revealed. On the outer aspect of the limb and two and a half inches above the centre of the outer malleolus was the third ulcer, whose fistulous tract extended obliquely upward and inward, through which denuded bone could be felt over a considerable surface. The bone was much hypertrophied through its whole extent; but no new bone enveloping the old was found to exist. His general health was far from being good; he was pale and anæmic, with no appetite, though he walked to school, distant one mile, and in the evenings complained of exhaustion and osteocopic pains. His parents

are healthy and entirely free from any scrofulous taint; they are of a long-lived race, and their circumstances are comfortable. He is a twin of the sixth birth, and enjoyed uninterrupted good health up to four years ago, when, after following the plow for several consecutive days, he complained of severe pain in the ankle joint, which rapidly developed into a well-marked case of erysipelas, which extended from the ankle to the knee joint; and from this cause the diseased bone had its inception. Pari passu with the erysipelas, he began to complain of a deep-seated pain directly over the hip joint, and which finally eventuated into a true case of morbus coxarius, from which he slowly recovered, with an anchylosed joint, and shortening to the extent of four inches.

I think it safe to conclude that the hip-joint disease was the result of traumatism, as was also the periostitis, or erysipelas, which ushered in the attack. After removing several small sequestra from the exterior and interior of the bone, he was put upon ferruginous and bitter tonics, I having determined to resect rather than amputate the leg.

On the 20th of September following, the boy having been chloroformed, and the Esmarch tourniquette applied, Drs. Young, Wilson and Clardy being present, an incision was made over the spine of the tibia, commencing just above the tuberosity through the centre of both ulcers to the tibio-astragaloid articulation eleven inches in length. This incision was carried through the soft parts, including the periosteum, which was found impossible to be raised, except in the vicinity of the ulceration on its front aspect; but laterally and posteriorly it was preserved almost entire. The tissues having been separated from the entire shaft, I then divided with a metacarpal saw the bone just below the tuberosity, and one and a half inch above the ankle joint. After lifting the bone from its trough-like bed, it showed completely the form of the posterior and lateral aspects of the bone indented upon the periosteum. No ligature was required; but the capillary oozing was considerable, which is always the case after using the Esmarch bandage, and which we regretted to control with persulphate of iron. The wound was carefully cleansed, rinsed out with carbolic acid solution,

and brought together with sutures and adhesive plaster. Over the line of incision a compress saturated with carbolic solution was now applied, and held in place with roller from toes to knee joint. The limb was now extended upon a straight splint well padded, and extending from the condyle of the femur beyond the sole of the foot, and placed to the inner side of the limb. This plan of support was requisite, because of the anchylosis of the hip joint and arching of the spinal column, which forbade the patient from assuming the dorsal position. The shock of the operation was very considerable, but in eighteen hours he had reäcted nicely and improved from the outset. Nothing unusual occurred in the progress of the case; the wound rapidly filled up by granulations, and after two months had filled entirely. The limb, however, was flexible. The splint, by pressure on the condyles and malleoli, gave pain, and had produced redness and excoriation. At this juncture the plaster encasement was applied, which was opened by a window above and below for the purpose of cleansing and disinfecting. This dressing gave admirable support, and permitted him to get about on crutches, both in and out of doors, with little or no pain. After five weeks the plaster encasement was removed, and we had the satisfaction of seeing that the limb was not so flexible; that it had gained in solidity, and that on it he could bear some weight.

January 1.—The boy has greatly improved; is fat and rosy; appetite, sleep and digestion good; solidification has progressed rapidly, except for two inches below the tuberosity of tibia. There is no shortening of this part of the limb, nor is there any dislocation of the fibula.

January 15.—In less than four months from date of operation we find new bone extending from the inferior extremity to within two inches of the superior, and doubt not in the next four months this breach will be filled with osseous deposits. With the aid of his crutch he walks about anywhere; can bear considerable weight on his leg, and indulges the hope soon to walk without any mechanical support.

The portion of bone removed measured eight and a half inches in length and five and a half inches in its largest circumference, as against about three inches, the average circumfer-

ence of healthy bone in the adult. On being divided longitudinally, the medullary canal was found devoid of medullary matter, with destruction of the internal periosteum for the most part.

In referring to the literature of subperiosteal resection of the shaft of long bones, we are surprised at the small number of recorded cases. This seems remarkable, from the fact that the bone-producing power of the periosteum has long been recognized by surgical pathologists. The first of the ancients to recommend excision of shafts of bone was Paulus Ægineta, who says: "In like manner the extremity of a bone near a joint, if diseased, is to be sawn off; if the whole of a bone, such as the radius, ulna, tibia, or the like be diseased, it is to be taken out entire." Excision therefore of the long bones in whole or in part is of ancient origin.

Taylor, of Wakefield, England, removed the lower extremity of the tibia in 1789.

Langenbeck was the first to execute a subperiosteal excision of the ankle joint for gun-shot wound in 1859.

Dr. David Cheever, of Boston, removed nine inches of the tibia, including the lower epiphysis, with recovery and a useful limb in 1870; and more recently, in the same city, both Dr. Buckingham and Dr. Ropes have successfully removed the diaphysis of the tibia with excellent results.

Dr. Oscar Newland, of Hopkinsville, Ky., related to me the removal by him of the diaphysis of the tibia, with recovery and a useful limb.

Dr. Theodore Varick, of New York City, removed five and three-eighths inches of the tibia by subperiosteal resection, the patient recovering with a perfectly restored limb, in 1874. This case is reported in the "New York Medical Journal," January, 1878; and from his report I have copied the following subjoined cases reported by different surgeons:

Dr. Neudorfer, an Austrian surgeon, reports twelve cases of resections from the shafts of bone which recovered, and "that in none of these did reproduction fail to ensue, nor in any of them was a false joint left."

Dr. Kempster removed for gun-shot injury two and a half

inches of the tibia. "Two months after the operation the gap was filled up by a hard mass, which no longer allowed of any motion of the fragments, and the patient was permitted to leave his bed."

Dr. Conant, of New York, removed three-eighths of an inch of the tibia for compound comminuted fracture of that bone with fracture of the fibula, in the person of a boy seven years of age, who recovered with half an inch shortening, and with reproduction of bone, in 1865.

Dr. W. P. Moon, of Philadelphia, removed eight and a half inches of the tibia for necrosis by subperiosteal resection, with recovery, in 1865; and during the same year he removed in the same way five and a half inches from another case with an equally successful result.

M. Ollier, in his work on the "Regeneration of Bone," remarks: "That removals of the diaphysis, and especially both diaphysis and epiphysis of the tibia are rare." In proof of which he only cites five cases, an epitome of which is copied in Dr. Varick's paper in the journal referred to.